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June 21, 2018

Ms. Catherine Brown
Federal Facilities Cleanup Branch
U.S. Environmental Protection Agency
Region IX, SFD-8-1
75 Hawthorne Street
San Francisco, CA 94105

Subject: **Contract No. EP-W-07-066/Task Order No. 066-017-09Q7; Former George Air Force Base; Review of the Air Force Notice of Negative Impacts from the City of Adelanto Sewage Treatment Plant Letter and Associated Adelanto Sewage Treatment Plant (STP) Artificial Recharge Impacts Briefing Presentation, April 2018; and the Adelanto STP Water Level Rise Supplemental Charts, June 2018, Former George AFB, Victorville, California,**

Dear Ms. Brown:

TechLaw completed a Review of the Air Force Notice of Negative Impacts from the City of Adelanto Sewage Treatment Plant (the Adelanto STP Ponds) Letter (the Letter) and the associated June 20, 2018 Briefing Presentation: Adelanto Sewage Treatment Plant (STP) Artificial Recharge Impacts dated April 3, 2018. Also, we reviewed the Adelanto STP Water Level Rise Supplemental Charts dated June 19, 2018, Former George AFB, Victorville, California.

The review finds that there will be impacts from the Adelanto STP Ponds on the remedial action at the 4 sites discussed. However, it is unclear if these impacts will be negative overall. For example, an increasing gradient may shorten the remediation time. It is not uncommon for gradients and water levels to change at Superfund sites over the course of the remedial action. Assessing these changes is usually done at the Five Year Review. However, this issue was not mentioned in the Draft Fourth Five Year Review dated June 21, 2016. The Air Force should reassess the individual sites with this new gradient and water level information to better understand and address potential impacts on the remedial actions at these sites.

This evaluation has been forwarded to you through electronic mail in Word format. TechLaw understands you will review and augment the evaluation at your discretion. Thank you for the opportunity to provide U.S. EPA with technical oversight services at the Former George AFB. Should you have any questions or comments, please contact me at (510) 290-2044.

Sincerely,

Indira Balkissoon
ROC9 Senior Task Order Manager

GB:IB:JB:as

cc: Ms. Maeve Clancy
Central Files

FORMER GEORGE AIR FORCE BASE

Victorville, California

Review of the Air Force Notice of Negative Impacts from the City of Adelanto Sewage Treatment Plant Letter and the June 20, 2018 Briefing Presentation: Adelanto Sewage Treatment Plant (STP) Artificial Recharge Impacts, Former George AFB, Victorville, California, April 2018

Submitted to:

Ms. Catherine Brown
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Submitted by:

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Task Order No.	**066-17-09Q7**
Contract No.	**EP-W-07-066**
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June 21, 2018

Review of the Air Force Notice of Negative Impacts from the City of Adelanto Sewage Treatment Plant Letter and the June 20, 2018 Briefing Presentation: Adelanto Sewage Treatment Plant (STP) Artificial Recharge Impacts, Former George AFB, Victorville, California, April 2018

GENERAL COMMENTS

1. Both the Air Force Notice of Negative Impacts from the City of Adelanto Sewage Treatment Plant (Adelanto STP Ponds) (the Letter) and the June 20, 2018 Briefing Presentation: Adelanto Sewage Treatment Plant (STP) Artificial Recharge Impacts (the briefing presentation) lack specific details to support the conclusion that there are negative impacts to the George Remedial Actions from the Adelanto STP Ponds. Please provide specific information on the negative impacts to the ongoing remedial actions and discuss the extent of the impacts.

2. The briefing presentation is missing many of the monitoring wells shown in the hydrographs. For example, NZ-10 and MW-103 hydrographs are shown on slide #6 of the briefing package; however, a maps depicting well locations was not provided. Please ensure that a map showing all well locations discussed in the Letter and the briefing presentation is provided during the upcoming June 20, 2018 briefing.

3. The Section 3.2.1 of the 2016 Basewide Annual Monitoring and Operations Report indicates that the rising groundwater levels on the western side of the base are due to recharge from the Adelanto STP Ponds. A TechLaw memo dated July 2017 discussed possible impacts from this recharge and recommended that future reports focus specifically on this problem. However, to date no information has been provided. Please provide a summary of possible impacts from this recharge in the upcoming 2017 Basewide Annual Monitoring and Operations Report.

4. It appears that water levels are rising at the 4 remediation sites noted in the Letter, but the amount of rise is not uniform. The Letter also states that there has been "significant harm" to the effectiveness, cost, and duration of the CERCLA Remedy at IRP site OT-69e and non-CERCLA site ST067b; however, the details provided in the briefing presentation for OT-69e do not support such an assessment. Please provide additional supporting evidence that describes impacts to OT-69e due to the changing water levels.

5. The Adelanto recharge is creating a groundwater mound in the shallow aquifer. Accurate site-wide modeling of the aquifer system in the area could provide information regarding how extensive the mounding will become. The future changes can be reasonably calculated with groundwater modeling, including: water levels, flow directions, gradients, flow velocities, and even water quality. If appropriate, please propose a method to provide information on how extensive the mounding could be in the future.

6. Information should be provided to evaluate the potential for the Adelanto Ponds to assist the effectiveness of the remedial actions at each site. Not all impacts from the recharge is necessarily negative. For example, a potential interpretation at OT69 is that formerly "trapped" contamination is being mobilize and that cleanup time will likely be shortened. Please re-assess each site and provide additional information to include potential impacts which may also assist the effectiveness of the remedial actions at each site.

7. The water levels will continue to rise for several years, even if the recharge is stopped immediately. Please acknowledge this in future discussion of the remedial action at the 4 sites.

8. The degree of harm caused by the negative impacts is not well documented. Please provide some indication of the additional resources that will be required to assess the degree of harm caused by the negative impacts (number of wells, samples, equipment modifications, etc.)

9. It is unclear from the information provided if the Air Force believes that the existing remedies are still protective. Please re-assess the protectiveness of the existing remedies.

SPECIFIC COMMENTS –JUNE 20th BRIEFING PRESENTION ADELANTO STP PONDS, APRIL 2018

1. **Slide #5, Upper Aquifer Wells and Major Artificial Recharge Areas:** There is some anecdotal information that the High Desert Power Plant (HDPP) may have been a source of recharge to the Upper Aquifer in the area south of site FT-082. However, until 2004, treated groundwater from the George AFB Extraction Treatment System (GETS) was discharged into "the arroyo" approximately 2500 feet north-northeast of site FT082. This was near the eastern edge of the MLU/PLZ boundary. Please provide information on the impacts of the HDPP and the GETS discharge to the arroyo on groundwater levels.

2. **Slide #6, New Percolation Pond (NPP) Hydrographs:** It is unclear if water was being discharged at the NPP at the same time as water was being discharged to "the arroyo". The dates should be checked as it appears that the last discharge into the NPPs was in 2003, which appears to correspond to the time when the GETS system discharged to "the arroyo". It is interesting to note that these figures indicate that water levels at all 3 wells shown are significantly lower now, than they were when the Adelanto STP ponds began operation. Please clarify whether or not the NPP and "the arroyo" discharge occurred at the same time. Also, provide and explanation for the significantly lower water levels after the Adelanto Ponds began operation.

3. **Slide #6, New Percolation Pond (NPP) Hydrographs:** The slide appears to be missing the Hydrus trichloroethylene (TCE) modeling data even though the text refers

to the Hydrus TCE modeling. Additionally, it is unclear if the values presented in the graphs are actual field measurements or model inputs. Please clarify if this slide contains Hydrus TCE modeling information and if the graphs represent field measurements or modeling outputs.

4. **Slide #7, Golf Course Pond (GCP) Hydrographs:** Similarly, it is unclear if the Hydrus modeling plots contain actual or modeling data. The slide appears to indicate that the Hydrus modeling of Dieldrin will be negatively impacted. Please clarify this issue. Specifically, discuss if this information indicates that the existing Hydrus modeling data is invalid.

5. **Slide #17, Adelanto STP Hydrograph Location Map:** Adelanto Well MW-01 is described as completed in both the Upper and Lower aquifers. The description implies that this well could be a "conduit well" that is conducting water from the Upper to the Lower Aquifers. Additionally, water levels in well MW-01 might be questionable. Please include a schematic/cartoon depicting the well construction for MW-01.

6. **Slide #44, Select OT069 Hydrographs Across TCE Plume:** In the OT-69 area, well MW-48 is the well closest to the Adelanto Recharge; yet, after 9 years of that recharge, it shows a net decline of approximately 0.5 foot. The other wells shown on slide 44 indicate only about 1 foot of water level rise in the same 9-year period. Please provide an explanation.

7. **Slide #45, OT069 TCE and Water Level Time-Series:** Further explanation is required on the increasing TCE concentrations at OT069 in 3 of the 4 wells. This slide appears to imply that there is a negative impact of Adelanto STP Ponds on the remedial actions at this site since there is a one-foot rise in water levels. However, there are other potential interpretations of the TCE increases such as formerly "trapped" contamination at OT69 is being mobilize and that cleanup time will likely be shortened for the existing remedial actions. Please expand the interpretation of the Adelanto STP ponds impact on the remedial actions to include the possibility for positive impacts and propose optimization efforts to exploit possible opportunities. Alternatively, explain why the one-foot rise in water levels impacts the remedial actions only negatively.

8. **Slide #49, OT069 Long-term Monitoring Program Impacts:** If flow directions have changed as alleged, a summary that fully characterizes the severity of these impacts should be provided. This summary should include, for example, when contaminant levels in monitoring wells will increase and trends to indicate that contaminants that were formerly "trapped" are now being mobilized. Once mobilized, the contaminants can be cleaned up at a faster rate. It is possible that discharge from the Adelanto STP Ponds could be viewed as an improvement in the remedial actions at OT069, indicating the time to complete the remedy will likely be shortened. Please provide a summary that fully characterizes the severity of the Adelanto Ponds' impacts on OT069 and potential improvements.

SPECIFIC COMMENTS – ADELANTO STP POND SUPPLEMENTAL CHARTS JUNE 19, 2018

1. **Slide #46, MW-125:** This slide along with Slides 37, 38 & 39 in the Supplemental Maps and Time series graphs all indicate that the TCE plume at site OT069 is expanding and TCE concentrations are increasing. Since the remedy for this site is Monitored Natural Attenuation (MNA), this remedial action must be reevaluated to determine if MNA is still a protective remedy. The Draft 2016 Fourth Five Year Review also expressed concerns for the future protectiveness of this remedial action stating, on page ES-36: "*1) Collect additional data to further characterize the downgradient extent of the plume at Subsite OT069e.*" Please reevaluate the appropriateness of an MNA remedy at this site, considering the extensive expansion of the plume and the substantial increases in TCE concentrations.

2. **Supplemental Slide #39, MW-24:** Water levels in well MW-24 show a decline of 1 foot and the TCE concentrations have increased from 0.01 to 16ppb.
   The water level decline here is likely due to the lowered amount of recharge at the Golf Course, 3,500 ft to the southeast (SE), rather than the result of recharge at the Adelanto STP which are 12,000 feet to the northwest (NW). Factors such as this indicate that the changes in water levels, flow velocity, and flow direction can be attributed to several different causes, not just the recharge at the Adelanto STP ponds. Please re-evaluate other possible causes that are affecting the changes in groundwater flow at the Former George AFB.